Amendments to the Claims

This listing of claims replaces all prior versions and listings of claims in the application. Any amendments or cancellations to the claims are made without prejudice or disclaimer.

Listing of Claims:

1-3. (Cancelled)

4. (Previously presented) The optical device of claim 8, wherein upon reflection of the second beam by the reflector, the angle between the first and second beam is at least 1°.

5-7. (Cancelled)

8. (Previously presented) An optical device for receiving light, the device comprising:

(i) a polarizing beam splitter (PBS) that substantially reflects light of a first polarization and substantially transmits light of a second polarization orthogonal to the first polarization;

(ii) a reflector positioned to reflect light transmitted by the PBS towards the PBS and angled relative to the PBS such that a light beam that has a non-zero angle of incidence at the PBS is separated into a first beam having substantially the first polarization and a second beam having substantially the second polarization; and

(iii) a detector comprising a first and second region, the detector being positioned to receive the first beam in the first region and the second beam in the second region and to detect: (i) light reflected by the PBS and/or light reflected by the reflector; and (ii) the first and second beam.

9. (Previously presented) An optical device for receiving light, the device comprising:

a polarizing beam splitter (PBS) that substantially reflects light of a first polarization and substantially transmits light of a second polarization orthogonal to the first polarization;

a reflector positioned to reflect light transmitted by the PBS towards the PBS; and

a detector positioned to detect light reflected by the PBS and/or light reflected by the reflector,

wherein: (i) the PBS comprises substrate having a first angled surface and second angled surface, at least one of which being coated with a substantially parallel array of elongated conducting elements, (ii) the coated surface substantially reflects light of the first polarization and substantially transmits light of the second polarization, and (iii) the reflector comprises a coating on the second surface of the PBS substrate.

10. (Previously presented) The optical device of claim 8 further comprising a polarizer positioned in the path of the first beam, but not the second beam, wherein the polarizer is oriented to substantially transmit light of the first polarization.

11. (Cancelled)

12. (Previously presented) A method of detecting fluorescence polarization of a sample, the method comprising:

exciting the sample with excitation light;

directing emitted light from the sample at the optical device of claim 8; and

detecting light at the detector.

13. (Original) The method of claim 12 wherein the PBS comprises substrate having a first and second surface, at least one of which being coated with a substantially parallel array of elongated conducting elements, and the coated surface substantially reflects light of the first polarization and substantially transmits light of the second polarization.

14. (Original) The method of claim 12 wherein the excitation light is polarized in a single plane.

15. (Original) The method of claim 12 wherein the excitation light is circularly polarized.

16. (Previously presented) A method of detecting fluorescence polarization of a sample, the method comprising:

exciting the sample with excitation light;

directing emitted light from the sample at an optical device for receiving light; and

detecting light at the detector,

wherein the optical device comprises:

(i) a polarizing beam splitter (PBS) that substantially reflects light of a first polarization and substantially transmits light of a second polarization orthogonal to the first polarization;

(ii) a reflector positioned to reflect light transmitted by the PBS towards the PBS and angled relative to the PBS such that a light beam that has a non-zero angle of incidence at the PBS is separated into a first beam having substantially the first polarization and a second beam having substantially the second polarization; and

(iii) a detector positioned to detect: (a) light reflected by the PBS and/or light reflected by the reflector; and (b) the first and second beam,

and wherein the detecting comprises detecting light in the first and second beam.

17. (Original) The method of claim 16 wherein the light in the first and second beam are detected concurrently.

18-22. (Cancelled)

23. (Previously presented) A method of detecting fluorescence polarization of a sample, the method comprising:

exciting the sample with first polarized excitation light;

directing first emitted light from the sample at the optical device of claim 8;

detecting light in the first and second beam to evaluate orthogonal components of the first emitted light;

exciting the sample with second polarized excitation light, non-parallel to the first polarized excitation light;

directing second emitted light from the sample at the optical device;

detecting light in the first and second beam to evaluate orthogonal components of the second emitted light; and

determining a first value that is a function of the components of the first emitted light and a second value that is a function of the components of the second emitted light.

24. (Original) The method of claim 23, further comprising evaluating a function that depends on the first and second values.

25-28. (Cancelled)

29. (Previously presented) A polarizing beam splitter (PBS) comprising:

an optically transparent substrate, having a front surface and a rear surface angled relative to the front surface;

a generally parallel array of elongated elements disposed on the front surface of the substrate configured to substantially reflect light of a first polarization, and substantially transmit light of a second polarization orthogonal to the first polarization; and

a reflective coating disposed on the rear surface,

wherein the elements are composed of aluminum or silver.

30. (Previously presented) The PBS of claim 29, 32, 35, or 36, wherein the array is configured to polarize light having a wavelength between 380 nm and 780 nm.

31. (Original) The PBS of claim 30 wherein the array is configured to polarize light having a wavelength between 420 and 600 nm.

32. (Previously presented) A polarizing beam splitter (PBS) comprising:

an optically transparent substrate, having a front surface and a rear surface angled relative to the front surface;

a generally parallel array of elongated elements disposed on the front surface of the substrate configured to substantially reflect light of a first polarization, and substantially transmit light of a second polarization orthogonal to the first polarization; and

a reflective coating disposed on the rear surface, wherein the angle between the front and rear surfaces is between 5 and 50°.

33. (Previously presented) The PBS of claim 29, 32, 35, or 36, wherein the reflective coating does not substantially alter the polarization of light that it reflects.

34. (Previously presented) The PBS of claim 29, 32, 35, or 36, wherein the reflective coating is substantially uniform.

35. (Previously presented) A polarizing beam splitter (PBS) comprising:

an optically transparent substrate, having a front surface and a rear surface angled relative to the front surface;

a generally parallel array of elongated elements disposed on the front surface of the substrate configured to substantially reflect light of a first polarization, and substantially transmit light of a second polarization orthogonal to the first polarization; and

a reflective coating disposed on the rear surface, wherein the substrate is a wedge.

36. (Previously presented) A polarizing beam splitter (PBS) comprising:

an optically transparent substrate, having a front surface and a rear surface angled relative to the front surface;

a generally parallel array of elongated elements disposed on the front surface of the substrate configured to substantially reflect light of a first polarization, and substantially transmit light of a second polarization orthogonal to the first polarization; and

a reflective coating disposed on the rear surface, wherein the rear surface is angled relative to the front surface such that a light beam that has a non-zero angle of incidence at the front surface is separated into a first beam having substantially the first polarization and a second beam having substantially the second polarization, and upon reflection of the second beam by the reflector, the angle between the first and second beam is at least 1°.

37. (Cancelled)

38. (Cancelled)

39. (Currently amended) A method comprising:

providing a plurality of spatially distinct nucleic acid samples and amplification reagents that comprises a fluorophore attached to a nucleic acid primer;

concurrently ~~amplifying~~ subjecting each sample of the plurality to nucleic acid amplification conditions; and

during the ~~amplifying~~ subjecting, concurrently detecting fluorescence polarization information associated with the fluorophore from each sample of the plurality, wherein the detecting comprises separating first and second polarity light using ~~an element that~~ the optical device of claim 8 ~~reflects first polarity light and transmits second polarity light, wherein the first polarity light is polarized in a first plane and the second polarity light is polarized in a plane orthogonal to the first plane~~.

40. (Original) The method of claim 39 wherein the first and second polarity light are detected concurrently.

41. (Original) The method of claim 39 wherein the first and second polarity light are detected by the same detector.

42. (Currently amended) The method of claim 39 wherein the ~~element~~ optical device comprises an optically transparent substrate having a first and second surface and a parallel array of conductive material coated on the first surface.

43. (Previously presented) An apparatus comprising:

the optical device of claim 8;

a light source;

a retainer configured to position a sample to receive light from the light source and to direct light emitted from the sample to the optical device.

44-49. (Cancelled)